

**AMENDMENTS TO THE DRAWINGS**

The attached sheet of drawings includes changes to Fig. 1 to add the legend "Prior Art". This sheet replaces the original sheet.

Attachment: Replacement Sheet (1)

## **REMARKS/ARGUMENTS**

### **1.) Claim Amendments**

The Applicant has amended claims 1, 4-5, 7, 11 and 14-16. New claims 20-23 have been added. Support for the new claims can be found in Figures 3-4, and 6-7 and page 16, lines 4-25, page 17, lines 1-25, page 18, lines 1-21, page 20, lines 4-22, page 21, lines 1-24 and page 22, lines 1-12. Claims 1, 4-11, 14-23 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

### **2.) Allowable Subject Matter**

In paragraph 10 of the Office Action, the Examiner objected to claims 4, 5, 7, 14, and 15 as being dependent on a rejected base claim, but stated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. The Applicant has rewritten the claims in this manner. Therefore, the withdrawal of the objection and the allowance of claims 4, 5, 7, 14, and 15 are respectfully requested.

### **3.) Examiner Objections - Drawings**

In paragraph 3 of the Office Action, the Examiner objected to the drawings because Fig. 1 should be designated by a legend such as --Prior Art--. The Applicant has amended Fig. 1 as recommended by the Examiner. The Examiner's approval of the drawing replacement sheet is respectfully requested.

### **4.) Examiner Objections - Specification**

In paragraph 4 of the Office Action, the Examiner objected to the specification because of informalities and requested that the Applicant amend the specification to add the appropriate section headings into the specification. The Application respectfully draws the Examiner's attention to the Preliminary Amendment that was filed on July 31, 2001, in which the Applicant has already amended the specification to include the appropriate section headings.

**5.) Claim Rejections – 35 U.S.C. § 102(e)**

In paragraphs 5-6 of the Office Action, the Examiner rejected claims 1 and 11 under 35 U.S.C. § 102(e) as being anticipated by Currie (US 5,974,433) (“Currie”). Applicants respectfully traverses Examiner’s reasoning and conclusion as follows:

In paragraph 6 of the Office Action, Examiner stated as follows:

Re claim 1, Currie discloses in Figure 3 an electrical device for generating multirate PN sequence (e.g. abstract; col. 2 lines 14-19 wherein PN sequence output as M-sequence; and output of 314 with PN code label at 315) comprising:

a sequence generation (e.g. outputs of 308 into 309) to output a plurality sequence values based of a step control signal (St) (e.g. output of 304 as the control signal to the mux);

a selection system (e.g. 309A and 309B without label) to select one of plurality of sequence values (e.g. outputs from 308) on the basis of a select value (Mt) (e.g. output of 305 as Mt), wherein the select value (Mt) provided on the basis a clock control value (e.g. 300) or signal (Ct) and a previously generated select value (e.g. 2-bit counter ck, it must store or generated based on the previous sample);

and a step control (e.g. 304) adapted provide step control signal (St) (e.g. output of 304 into 308) wherein the step control signal (St) (e.g. output of 304) is provided based on a clock control value (e.g. 300) or signal (Ct) and a previously generated selected value (e.g. 2-bit counter clk, it must store or generated based on the previous sample).

The present invention discloses two functional modules, a “sequence generator” (the top module) and a “control and select system” or “CS system” (the lower module) as seen in Figures 3-4 and 6-7 of Applicant’s disclosure. Currie does not disclose the operations provided by the lower module of the present invention.

Currie describes a system for generating an m-sequence (which may be a pn sequence) but it does not thereafter select a value from the plurality of intermediate sequence values (e.g.,  $X_{Ni} \dots X_{Ni+N-1}$ ) to provide the PN output sequence ( $Z_t$ ) as does the lower module of the present invention. Currie only discloses a different implementation of the top module of the present invention.

As noted in Figures 3-4 and 6-7 of the present invention, the step control signal ( $S_t$ ) is feed from the lower module to the top module. The step control signal ( $S_t$ ) depends on ( $C_t$ ) and ( $M_{t-1}$ ) but since  $(M_{t-1}) = (C_t) - 1 + (M_{t-2}) \bmod 2$ , then the step control

signal ( $S_t$ ) depends on ( $C_t$ ) and ( $C_{t-1}$ ) and ( $M_{t-2}$ ), and, since ( $M_{t-2}$ ) depends on ( $C_{t-2}$ ), it is clear that the step control signal ( $S_t$ ) depends on ( $C_{t-2}$ ) as well, and so on, providing a historic memory effect. Thus the value of ( $S_t$ ) and ( $M_t$ ) which together determine the step in the sequence generator depends on the current value of ( $C_t$ ) as well as the past values of ( $C_t$ ). This historic memory effect of the present invention does not exist in the Currie invention.

Currie does not select values from the sequence in the way described above. Currie does not provide for non-uniform sampling. In particular there is no feedback indicated between elements 304, 305 and 300 of Currie, which the Examiner has compared to ( $S_t$ ), ( $M_t$ ) and ( $C_t$ ). If there is a two bit counter in elements 304 and 305 of Currie, then this can simply generate 0, 1, 2 and 3 repeatedly. In the Currie disclosure, the select value ( $M_t$ ) is dependent *only* on a clock signal and *not* on the clock control value or signal ( $C_t$ ) and a previously generated select value ( $M_{t-1}$ ) as is provided in Claims 1, 11 and 20 of the present application. In effect, Currie only discloses another method to implement the top module as seen in Figures 3-4 and 6-7 of Applicant's disclosure. Currie does not disclose nor suggest the operations provided by the control and select system (CS system) as seen in Figures 3-4 and 6-7 of Applicant's disclosure. There is no teaching in Currie of providing a step control signal ( $S_t$ ) based on a clock control value or signal ( $C_t$ ) and the previously generated select value ( $M_{t-1}$ ) and then feeding back that signal ( $S_t$ ) to the sequence generator, which is seen as the top module in Figures 3-4 and 6-7 of the Applicant's disclosure.

Currie only discloses a type of sequence generator (e.g., the top module seen in Figures 3-4 and 6-7 of the Applicant's disclosure). Specifically, Currie discloses a method of generating a high rate m-sequence where linear feedback shift registers (LFSRs) are clocked at reduced speed and where, for certain  $k$  (i.e.  $k=2^m$ ) values, complexity of interstate adders can be kept simple. Currie only produces a pn-sequence that consists of an m-sequence, albeit at a higher  $k > 1$  *fixed* rate. There is no teaching in Currie as to how to get a pn output sequence ( $Z_t$ ) selected from an m-sequence ( $X_{N_i} \dots X_{N_i+N-1}$ ) that is selecting at different rates as in the present invention. It is important to note that in the present invention,  $C_{(t)}$  varies with  $t$ .

This implies that, in general, the resulting sequence of the present invention is not an m-sequence. Only when  $C_{(t)}$  is constant and satisfying some additional mathematical conditions (for example  $C_{(t)}=2^m$ ), is the resulting sequence an m-sequence. Applicant has amended Claims 1 and 11 to further clarify the data flows of the present invention in contrast to Currie. Support for these amendments can be found in Figures 3-4, and 6-7 and page 16, lines 4-25, page 17, lines 1-25, page 18, lines 1-21, page 20, lines 4-22, page 21, lines 1-24 and page 22, lines 1-12. In light of the foregoing, the requirements for a Section 102(e) rejection have not been met because at least one recited limitation of the present invention is not found in Currie. Applicant respectfully requests the withdrawal of the rejection and allowance of claims 1 and 11.

#### **6.) Claim Rejections – 35 U.S.C. § 103(a)**

In paragraphs 7-8 of the Office Action, the Examiner rejected claims 6 and 16 under 35 U.S.C. Section 103(a) as being obvious over Currie in view of Smeets, et al. "Windmill PN-Sequence Generators" ("Smeets"). As noted above, Currie describes a system for generating an m-sequence (which may be a pn sequence) but it does not thereafter select values from the intermediate sequence values (e.g.,  $X_{Ni} \dots X_{Ni+N-1}$ ) to provide the pn output sequence ( $Z_i$ ) as does the lower module of the present invention. Smeets discloses a windmill generator capable of producing blocks of  $v$  consecutive symbols in parallel. Currie is directed to solving the same problem disclosed in Smeets (as performed by the top module of the present invention), that is to generate  $k$  consecutive bits of an m-sequence each time the LFSRs are clocked once. These  $k$  bits can then be multiplexed to generate the complete m-sequence  $k$  times faster than the LFSR clocking. However, the rate at which this is done is *fixed*. As an aside, a person skilled in the art would not use or consider the approach of Currie over the windmill generator approach of Smeets in a sequence generator as Currie requires much more hardware (in particular multiplexers) than the windmill generator approach. The windmill generator approach gives a similar same result as Currie, but is a much more efficient and streamlined design.

Neither Currie nor Smeets disclose nor suggest the operations performed by the control and select system (lower module) as seen in Figures 3-4 and 6-7 of the present

invention. Even if there was a suggestion or motivation in Currie and Smeets to combine them, such combination would not constitute the present invention nor achieve the objectives of the present invention as such combination would not be able to perform the operations performed by the lower module of the present invention. As noted by the Federal Circuit in their "teaching-suggestion-motivation" test, an invention cannot be held obvious under Section 103 in the absence of some proven "suggestion, teaching or motivation" that would have led a person of ordinary skill in the art to combine the relevant prior art teachings in the manner claimed to obtain the claimed invention. The requirements for a Section 103(a) rejection have not been met because the combination of Currie and Smeets do not teach, suggest or provide a motivation that gives rise to the both the sequence generator (top module) and control and selection system (lower module) of the present invention. Applicant respectfully requests the withdrawal of the rejection and allowance of claims 6 and 16.

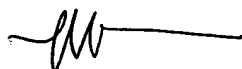
In paragraph 9 of the Office Action, the Examiner rejected claims 8-10 and 17-19 under 35 U.S.C. § 103(a) as being obvious over Currie in view of Saints, et al. (US 6,430,170). As noted above, Currie describes a system for generating an m-sequence (which may be a pn sequence) but it does not thereafter select values from the intermediate sequence values (e.g.,  $X_{Ni} \dots X_{Ni+N-1}$ ) to provide the pn output sequence ( $Z_i$ ) as does the present invention. Saints provides a system and method of generating random numbers from energy computations. As seen in Figure 4 of Saints, energy measurements are collected in a pool of bits and the bits are hashed to extract random numbers. The method and system of Saints can be used in a portable device such as a mobile terminal. The requirements for a Section 103(a) rejection have not been met because, even assuming a teaching, suggestion or motivation to combine the references, such combination would not constitute the present invention nor achieve the objectives of the present invention as such combination would not be able to perform the operations performed by the control and selection system (lower module) of the present invention. Applicant respectfully requests the withdrawal of the rejection and allowance of claims 8-10 and 17-19.

**CONCLUSION**

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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